

REMARKS

This Amendment is filed in response to the Office Action mailed on March 16, 2007. All objections and rejections are respectfully traversed.

Claims 1, 7, 10, 27, and 29-30 are currently pending.

Request for Interview

The Applicant respectfully requests a telephonic interview with the Examiner after the Examiner has had an opportunity to consider this Amendment, but before the issuance of the next Office Action. The Applicant may be reached at 617-951-3067.

Claim Rejections – 35 U.S.C. §102 and §103

At paragraphs 3-4 of the Office Action, claims 1, 7, 8, and 27-30 were rejected under 35 U.S.C. §102 as being anticipated over Tanizaki et al., Japanese Patent No. 4-274174, hereinafter Tanizaki.

At paragraphs 6-7 of the Office Action, claim 9 was rejected under 35 U.S.C. §103 as being unpatentable over Tanizaki, and in view of Reynolds et al., US Patent No. 5,985,475, hereinafter Reynolds.

The present invention, as set forth in claim 1, comprises in part:

1. A fluid controlling assembly for use in a direct oxidation fuel cell, which fuel cell has an anode chamber and a cathode chamber, the assembly comprising:

an adjustable component at least a portion of which is disposed within the cathode chamber of the fuel cell, and said component, when

adjusted, regulates the rate at which fluids travel into and out of the cathode chamber of the fuel cell, wherein the adjustable component has a first component and a second component that each include corresponding apertures, and the first and second components are lined with a gas permeable, liquid impermeable film that controls the rate of flow of oxygen therethrough to control the cathode reactions, yet restricts the flow of liquid water therethrough such that humidity is maintained within the cathode chamber.

By way of background, Tanizaki discloses a fuel cell with an air reduction electrode (cathode) and a fuel oxidizing electrode (anode). A slidable shutter plate is located between the fuel chamber or air chamber and the electrodes that are adjacent. (0010). The shutter plate allows the amount of air supplied to the air reaction layer to be controlled. (0013). The goal of the Tanizaki is to reduce the amount of fuel that diffuses to the air reduction electrode (cathode) when there is a stoppage of cell reactions, which causes heat generation and loss of cell capacity at start-up. (0008). The problem is solved by closing the holes in the shutter plate in the fuel oxidizing electrode (anode) to prevent diffusion of fuel into the air reduction electrode (cathode). (0013).

Reynolds discloses a metal-air cell with a permeable membrane. A first membrane having a polymeric perfluoro compound is stretched across the anode. The polymeric perfluoro compound exhibits selective transport of oxygen over water vapor, where the membrane and the compound have enhanced control over its water content. (Abstract, lines 2-6). A second membrane is stretched across the air side of the cathode. The second membrane does not include the polymeric perfluoro compound. (Col. 5, lines 28-35).

There is no teaching or suggestion in Tanizaki and Reynolds, taken alone or in combination, of Applicant's claimed novel *an adjustable component at least a portion of which is disposed within the cathode chamber of the fuel cell, and said component, when adjusted, regulates the rate at which fluids travel into and out of the cathode chamber of the fuel cell, wherein the adjustable component has a first component and a second component that each include corresponding apertures, and the first and second components are lined with a gas permeable, liquid impermeable film that controls the rate of flow of oxygen therethrough to control the cathode reactions, yet restricts the flow of liquid water therethrough such that humidity is maintained within the cathode chamber.*

Reynolds teaches away from Applicant's claimed invention by not using the polymeric perfluoro compound in the second membrane. The polymeric perfluoro compound exhibits selective transport of oxygen over water vapor, where the membrane and the compound have enhanced control over its water content. (Abstract, lines 2-6). Reynolds design specifically states that the compound is not part of the second membrane which covers the cathode, therefore Reynolds teaches away from having enhanced control over the water vapor to the cathode. Applicant's invention controls the water vapor leaving the cathode and the air into the cathode. Furthermore, Tanizaki's goal is to stop crossover of fuel to the cathode, which is accomplished by blocking the fuel and not the air to the cathode. Therefore, Tanizaki does not give suggestion to modify Reynolds to control the water vapor leaving the cathode to maintain humidity within the cathode chamber, without improper hindsight from Applicant's claimed invention.

Accordingly, Applicant respectfully urges that Tanizaki and Reynolds, taken alone or in combination, are legally insufficient to make obvious the presently claimed invention under 35 U.S.C. § 103 because of the absence of the Applicant's claimed novel *an adjustable component at least a portion of which is disposed within the cathode chamber of the fuel cell, and said component, when adjusted, regulates the rate at which fluids travel into and out of the cathode chamber of the fuel cell, wherein the adjustable component has a first component and a second component that each include corresponding apertures, and the first and second components are lined with a gas permeable, liquid impermeable film that controls the rate of flow of oxygen there-through to control the cathode reactions, yet restricts the flow of liquid water there-through such that humidity is maintained within the cathode chamber.*

At paragraph 5 of the Office Action, claims 1, 7, 10, 27, and 29 were rejected under Horiguchi et al., US Patent Application Publication No. 2002/0025460, hereinafter Horiguchi.

By way of background, Horiguchi discloses fuel cell power generating apparatus using a fuel cell. The fuel cell has a cathode and an anode disposed on opposite sides of an electrolyte membrane. Atmospheric air is supplied to the cathode using a blower. A controller controls a nozzle that sprays water onto the surface of the cathode to maintain a proper moisture condition on the electrolyte membrane. The controller also controls a valve that exhausts the deleterious gas from the anode. Additionally, the fuel cell includes air outlet manifold to exhaust air and water discharged from the cathode.

Applicant respectfully urges that Horiguchi does not disclose Applicant's claimed novel *an adjustable component at least a portion of which is disposed within the cathode chamber of the fuel cell, and said component, when adjusted, regulates the rate at which fluids travel into and out of the cathode chamber of the fuel cell, wherein the adjustable component has a first component and a second component that each include corresponding apertures, and the first and second components are lined with a gas permeable, liquid impermeable film that controls the rate of flow of oxygen there-through to control the cathode reactions, yet restricts the flow of liquid water there-through such that humidity is maintained within the cathode chamber.*

Hroiguchi does not disclose or suggest a gas permeable, liquid impermeable film over the openings for regulating the humidity, as claimed by applicant. Hroiguchi only discloses a concentrator for separating the water from the discharge gas after it has left the cathode (Hroiguchi 0048). There is no disclosure in Hroiguchi of regulating the water vapor leaving the cathode and the air entering the cathode, where the water stays to humidify the cathode in Applicant's invention.

Accordingly, Applicant respectfully urges that Horiguchi is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel *an adjustable component at least a portion of which is disposed within the cathode chamber of the fuel cell, and said component, when adjusted, regulates the rate at which fluids travel into and out of the cathode chamber of the fuel cell, wherein the adjustable component has a first component and a second component that each include corresponding apertures, and the first and second components are lined*

with a gas permeable, liquid impermeable film that controls the rate of flow of oxygen therethrough to control the cathode reactions, yet restricts the flow of liquid water therethrough such that humidity is maintained within the cathode chamber.

At paragraph 8 of the Office Action, claim 10 was rejected under 35 U.S.C. §103 as being unpatentable over Tanizaki, and in view of Brucner, US Patent Application Publication 2002/0016684.

Applicant respectfully notes that claim 10 is a dependent claim that depends from an independent claim believed to be in condition for allowance. Accordingly, claim 10 is believed to be in condition for allowance.

All independent claims are believed to be in condition for allowance.

All dependent claims are dependent from independent claims which are believed to be in condition for allowance. Accordingly, all dependent claims are believed to be in condition for allowance.

Favorable action is respectfully solicited.

Please charge all fees occasioned by this paper to our Deposit Account No. 03-1237.

The Director is hereby authorized to charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/Shannen C. Delaney/
Shannen C. Delaney
Reg. No. 51,605
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500